BAG WITH ERGONOMICALLY DISPOSED HANDLE

Technical Field

This disclosure herein relates generally to the field of bags used to carry pourable product, and more particularly to the ergonomic disposition of handles on bags used to carry pourable product.

Background

Bags are often used to transport and act as a unit of commerce for pourable products. For example, seeds (such as birdseed and grass seed), dry cement, cat litter and water softening salt are often displayed for sale in bags on grocery store shelves. Those same bags are used to contain the product until it can be poured into its ultimate receptacle for use. Thus, such a bag should be designed to facilitate ergonomically convenient carrying and pouring of the contained product if the bag is to encourage a consumer to choose it for purchase over that of a competing bag of similar product.

Because many pourable products are sold in large units, the bags containing those products are unwieldy without the presence of some sort of mechanism aiding in the handling of the bag. Adding to the difficulty presented by the size of the bag is the additional problem that such bags of product are often heavy. Accordingly, carrying and manipulating such a bag has typically been aided by locating a centrally-disposed handle upon the bag. Even an ordinarily large and unwieldy bag may be easily carried with a single hand with the aid of a handle.

As shown in Figure 1, handles 100 are traditionally formed as holes defined within a header seal 102 that runs across the top edge 104 of a bag 105. The bag 105 has first and second lower corners 106 and 108. These handles 100 are centrally located to permit a consumer or user to carry the bag 105 in a balanced fashion and provide a lever arm R_1 that extends from the handle to a lower corner 108 that is positioned below a pouring region 110 defined within a corner. These handles may be defined, in part, by the top edge 104. While a bag 105 fashioned with such a handle 100 may be relatively easy to carry, such a bag 105 with this handle placement does not maximize the user's mechanical advantage gained by use of the handle 100 during pouring. Additionally, such a bag 105 does not maximize the controllability of the pouring aperture, potentially leading to some of the product mistakenly missing its target and thereby going to waste.

Summary

In general terms, the present invention relates to bags having a handle offset from the center of a bag opposite from a pouring spout or opening, wherein the center is defined by the two side edges of the bag. This configuration increases the lever action and mechanical advantage when a person pours contents from the bag.

One possible aspect of the invention is directed toward an apparatus for carrying and delivering pourable product. The apparatus comprises a bag having a centerline and a pouring region formed on one side of the centerline. A handle is operably connected to the bag and is on an opposite side of the centerline from the pouring region.

Another possible aspect of the invention comprises a bag having first and second side walls, an interior volume, an end edge, oppositely disposed corners formed along the

end edge, a centerline and a pouring region formed on one side of the centerline. Birdseed is positioned within the interior volume. A handle is operably connected to the bag and is adjacent one corner. The pouring region is adjacent to the oppositely disposed corner. The handle is defined by a hole passing through the first and second sidewalls.

Another possible aspect of the invention is directed to a method of manufacturing a bag for carrying and delivering pourable product. The method comprises: providing a bag having an end edge and oppositely disposed corners defined along the end edge; defining a pouring region adjacent to one corner of the bag; and positioning a handle adjacent to the oppositely disposed corner of the bag.

Another possible aspect of the invention is a method of pouring contents from a bag. The method comprises: gripping a handle on a bag with a first hand, the handle being positioned adjacent to a corner along a first end edge of the bag; gripping a second corner of the bag with a second hand, the second corner being positioned along a second end edge of the bag, the second end edge of the bag being positioned opposite the first end edge, and the second corner being positioned catercorner from the handle; and rotating the bag and pouring the contents through a hole defined adjacent to a corner along the first end edge of the bag and oppositely disposed from the handle.

Brief Description of the Drawings

Figure 1 illustrates a prior-art bag having a centrally disposed handle.

Figure 2 is a side-view of a bag configured according to one possible embodiment of the present invention.

Figure 3 is a partial cross-sectional view of the bag illustrated in Figure 2 taken along line 3-3.

Figure 4 illustrates the bag shown in Figures 2 and 3 being tipped to demonstrate a mechanical advantage provided by the present invention.

Figure 5 is a side view of an alternative embodiment of the bag illustrated in Figures 2-4.

Figure 6 is a side view of another alternative embodiment of the bag illustrated in Figures 2-4.

Figure 7 is a side view of another alternative embodiment of the bag illustrated in Figure 2-4.

Detailed Description

A preferred embodiment of the invention will be described in detail with reference to the drawings, wherein like reference numerals represent like parts and assemblies throughout the several views. Reference to the preferred embodiment does not limit the scope of the invention, which is limited only by the scope of the claims attached hereto.

Referring to Figures 2 and 3, a bag is generally shown as 200. The bag 200 is formed by two sidewalls 202 and 204 that are sealed along their perimeter 206 to define an interior volume 207. The bag 200 has a first end edge 208, a second end edge 210, and first and second side edges 212 and 214. The first edge 208 and the first side edge 212 form a first corner 216, and the first end edge 208 and the second side edge 214, form a second corner 218. Similarly, the second edge 210 and the first side edge 212 form a third corner 220, and the second end edge 210 and the second side edge 214, form

a fourth corner 222. The first and second side edges 212 and 214 define a centerline 224. Although the first end edge 208 is depicted as being at the top of the bag 200 and the second end edge 210 is depicted as being at the bottom, the first end edge 208 may be considered to be along the bottom of the bag 200, while the second end edge is along the top. When so considered, corners 216 and 218 are considered to be along the bottom edge of the bag 200, while corners 220 and 222 are considered to be along the top. The bag 200 can be formed using a variety of different materials such as plastics or cloth. Examples of plastics include polyethylene and polystyrene. Examples of cloth include burlap and cotton.

In one possible embodiment, a dashed line 226 is printed on the surface of the bag 200 to form a pouring region 228 and indicate where a user should cut open the bag 200 to form a pouring hole. The dashed line 226 extends diagonally across the second corner 218 of the bag 200 and from the first end edge 208 of the bag 200 to the second side edge 214 of the bag 200. In another possible embodiment, perforations are defined across the second top corner 218 in an orientation similar to which the dashed line 226 is drawn. The perforations provide a structural weakness in the bag 200 that permits a person to tear open the second corner 218 of the bag 200 and define a pouring hole (as illustrated in Figure 4). Other embodiments are possible. Examples include a pouring spout that is positioned at the pouring region 228 and is in fluid communication with the interior volume 207 of the bag 200, a removable patch that covers a hole in the bag 200, a pull string that a user can pull to tear open a portion of or all of the first end edge 208 of the bag 200, and a zipper closure or any other sort of resealable closure running across the first end edge 208 of the bag 200.

A handle 230 is formed in or attached to the bag 200 and is positioned proximal to the first end edge 208 of the bag 200. The handle 230 is offset from the centerline 224 of the bag 200. In one possible embodiment, the handle 230 is positioned adjacent to the first corner 216 of the bag 200 and is formed by a hole 232 defined through the first and second sidewalls 202 and 204 of the bag 200. Because most people grab the handle 230 with one hand and the fourth corner 222 with the other hand, positioning the handle 230 so that it is offset from the centerline 224 of the bag 200 in this manner provides a lever arm R_2 that extends from the handle 230 to the fourth corner 222. The lever arm R_2 of a bag having such an offset position is greater than the lever arm R_1 of the prior art.

When the bag 200 is formed from plastic, the first and second sidewalls 202 and 204 are heat sealed to one another in a heat-sealed region 234 surrounding the hole 232 that forms the handle 230. The heat-sealed region 234 provides structural reinforcement of the bag 200 at the location of the handle 230 and prevents contents from spilling through the hole 232 from the interior volume 207 of the bag 200. A reinforcing ring 236 extends through both sidewalls 202 and 204 of the bag 200 and is positioned along the perimeter of the hole 232. The reinforcing ring 236 provides structural rigidity to the handle 230. Additionally, two layers 238 and 240 of additional material line the first and second sidewalls 202 and 204 to provide a reinforcing structure for the handle 230. Other embodiments include only one layer of reinforcing material or do not include any layers of reinforcing material.

The bag 200 can be used to hold a variety of different contents that are pourable. Examples include birdseed, feed such as dog food or cat food, cat litter, salt, fertilizers, grass seed, dry cement, and the like.

In use, as shown in Figure 4, a user of the bag 200 supports the bag 200 by the handle 230. When maneuvering the bag 200 into a pouring position, the user grasps the bag 200 by its fourth corner 222 to apply a rotational force R_{rot} in order to tip the bag 200 into a pouring position. The mechanical advantage realized by the user of the bag 200 during the process of tipping the bag 200 into a pouring position is equal to the length of its effective lever arm R_2, which is maximized by its placement of the handle 230 in the first corner 216 of the bag 200. The user of the bag 200 need apply a minimal rotational force at the fourth corner 222 in order to tip the bag 200 into its proper pouring position--a desirable result for the user.

Additionally, control of a pouring hole 242 formed in the pouring region 228 is enhanced by strategically locating the handle 230. As the user tips the bag 200 by applying a rotational force R_{rot} to the fourth corner 222, the fourth corner 222 travels an arcuate route 244, the length of which is equal to radius R_2 multiplied by the angle through which the bag 200 is rotated. Similarly, the second corner 218 and hence the pouring hole 242 travels an arcuate route 246, the length of which is equal to radius R_3 multiplied by the angle through which the bag 200 is rotated. Thus, the ratio between the distance traveled by the pouring hole 242 and the fourth corner 222 is R_3/R_2. In other words, for every inch traveled by the fourth corner 222, the pouring hole 242 travels only R_3/R_2 of an inch.

By locating the handle 200 in the first corner 216, as described in relation to one possible embodiment, the distance R_3 is reduced as much as possible without reducing the distance R_2. As a result, control over movement of the pouring hole 242 is increased as much as possible while still maximizing the length of the lever arm R_2.

Referring to Figure 5, an alternative embodiment of a bag is generally shown as 248 and is similar to the embodiment illustrated in Figures 2 and 3, first and second corners 216 and 218. The bag 248 has a first end edge 208, second end edge 210, first and second side edges 212 and 214 and a dashed line 226 to mark where to form a pouring opening. A handle 250 having a gripping portion 252 is attached to and projects from the first side edge 212 of the bag 248. The handle 250 can be formed from any suitable material such as plastic, metal, rope loops, and the like. Additionally, the handle 250 can be attached to the bag 248 using any suite type of connection such as adhesive, fasteners such as rivets, and the like. The handle 250 also can be molded to the bag 248.

In one possible embodiment as shown, the handle 250 is positioned along the first side edge 212 of the bag 248 and adjacent to the first corner 216. Other possible positions for the handle 250 that increase the lever arm R_2 are possible. For example, the handle 250 can be attached to the first end edge 208 of the bag 248 or at a position that is distal to the first corner 216 but still provides for a lever arm that is greater than the lever arm of a bag in which the handle is positioned at the center of the first end edge 208.

Yet another possible embodiment of the bag is illustrated in Figure 6 and is generally shown as 252. The bag 252 has a first end edge 208, a second end edge 210, first and second side edges 212 and 214 that define a centerline 224, a first handle 254 similar to the handle 230, and a dashed line 226 to mark where to form a pouring opening. Additionally, a second handle 256 is positioned along the first end edge 208 of the bag 252 and is centered about the centerline 224. In this embodiment, a user can use the first handle 254 when pouring contents from the bag 252 and the second handle 256

when carrying the bag 252. The second handle 256 allows the bag 252 to be balanced when a user carries it.

Yet another possible embodiment of the bag is illustrated in Figure 7 and is shown generally as 258. The bag 258 has a first end edge 208, a second end edge 210, first and second side edges 212 and 214 defining a centerline 224, a handle 230, a dashed line 226 to mark where to form a pouring opening, and a pouring region 228 which is demarcated by the dashed line 226. As in the previous figures, the first corner 216 is located at the intersection of the first side edge 212 and the first end edge 208. The second corner 218 is located at the intersection of the second side edge 214 and the first end edge 208. The third corner 220 is located at the intersection of the first side edge 212 and the second end edge 210. The fourth corner 222 is located at the intersection of the second side edge 214 and the second end edge 210. The handle 230 is located along the end edge not containing the pouring region 228 and on the opposite side of the centerline 224 from the pouring region 228. In the specific embodiment depicted in Figure 7, the handle 230 is located in the second corner 218, catercorner from the pouring region 228.

When rotating the bag 258 into a pouring position, a user is expected to grasp the bag 258 by its handle 230 with a first hand and to grasp the bag 258 immediately beneath the pouring region 228 with a second hand. The user is also expected to apply an upward force with the first hand, rotating the bag 258 about the region grasped by the second hand, thereby maneuvering the bag 258 into a pouring position. Because the user's second hand is anticipated to grasp the region immediately beneath the pouring region 228, controllability of the pouring region is maximized, because R_3 (not shown)

effectively approaches 0. At the same time, the effective lever arm R_2 is maximized, thereby providing mechanical advantage for the bag's user.

Although the description of the preferred embodiments is quite specific, it is contemplated that various modifications could be made without deviating from the spirit of the present invention. Accordingly, it is intended that the scope of the present invention be dictated by the appended claims, not the description of the preferred embodiment and method.